ABSTRACT

BACKGROUND:

Accurate fit of dental prostheses is thought to be critical to the long-term success of the supporting structures whether those structures be teeth, mucosa, or implants. It had been stated that a passive fit of a reconstruction is important for a physiologic tissue response and long term osseointegration of implants. Due to the ankylotic character of the implants, stress induced by a misfit of the superstructures persists. Therefore, a passive fit of the superstructures is desirable to prevent uncontrolled stress not only in the adjacent bone but also in the reconstruction itself. It has been claimed that superstructures with a poor fit may lead to prosthetic complications such as loosening or fracture of screws, as well as fracture of frameworks or veneering ceramic and even fractures of abutments or implants. During conventional designing of pattern using pattern wax, stress concentrations occur which lead to distorted castings. A new method of designing and making pattern using 3D printing technology where these stress will be minimal. Marginal discrepancy has been related to the preparation of wax pattern and defect in the casting process so the misfit has to evaluate using RVG.

AIM:

The purpose of this study is to assess the accuracy of fit of casting obtained by two methods of pattern making viz, Conventional wax pattern and 3D printed pattern.

MATERIALS AND METHODS:

The following are the steps in methodology followed in the study.

- Selection of experimental model-completely edentulous Mandible.(1no)
- Placement of implants-A B D E positions (from mesial to distal)
- Impression making.
- Fabrication of master cast.
- Wax pattern of superstructure (Conventional and 3D printing methods).
- Casting of implant superstructure (Conventional and 3D printing methods).
- Fabrication of Radiographic paralleling device.
- X-rays (IOPA-Radiovisiography) of implants with superstructure using radiographic paralleling device.
- Evaluate the standardized radiographs for presence of misfit.
- Making the measurement on the radiographs.
- Statistical analysis is used to evaluate the fitting of superstructure.

RESULTS:

It was found that the misfit for the conventional wax technique in the various regions was with a mean value of 0.1436 and for the 3D printed wax technique mean value is 0.1358. These values were statistically analysed. The overall comparison of the means of various locations between the Groups also yielded a statistically significant difference.

CONCLUSION:

The present invitro study was undertaken to compare the cast of conventional technique and 3D printed technique for the marginal fit with radiograph using RVG. On the basis of the results obtained in the present study, it was concluded that marginal fit in 3D Printed technique is better compared to conventional technique.

(Key words : Implant superstructure, Framework, Conventional wax pattern, 3D Printing, Rapid Prototyping.)